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CHRONOLOGY OF THE ACCOUNT OF THE FLOOD IN P.*—A CONTRIBUTION TO THE HISTORY OF THE JEWISH CALENDAR.

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The student unfamiliar with the special characteristics of the Priestly Document might be inclined to doubt the possibility of discovering any recondite meaning in the remarkable series of statistics afforded by this writer throughout his work. All scholars, however, who admit the documentary theory at all, are agreed upon this as the most characteristic peculiarity of the Priestly Law Book, outside of its purely legal enactments, that it systematically skeletonizes the narrative, reducing it to a series of names and dates in the extreme of artificiality. So far as can be made consistent with his principal object, the history of the Law and the Covenants, the author reduces everything to an arithmetical statement. The history of the patriarchal period, for example, is comprised in ten *Toledoth* or Genealogies, of which Gen. v. the Book of the *Toledoth* of Adam, or xi. 10–26, the *Toledoth* of Shem, give the model, the story of the Creation (*Toledoth* of the Heaven and the Earth, leading up to the institution of the Sabbath i.–ii. 4a), of the Flood (*Toledoth* of Noah, leading up to the Covenant of Blood-shed ix. 1–17), and of Abram (*Toledoth* of Terah, leading up to the Covenant of Circumcision, Gen. xvii., and Acquisition of Machpelah, Gen. xxiii.), being exceptional and in the nature of digressions. Hence it is an agreed point among critics that the numbers in P are both systematic and significant, though the particular significance of many of these series of numerals is still doubtful.

We do not now propose to discuss the method followed in the dates of the Genealogies of Adam and of the patriarchs further than to call the reader's attention to the fact that the establishment of an *era* is obviously an object of importance to the writer. This era, the *Annus Mundi*, is in fact still employed by the Jews, and in exceptional cases by ourselves. We wish at present only to ascertain what P has to say on the subject of a calendar, believing in particular that his account of the Flood, with its extraordinary system of dates, will throw light upon the important but still obscure and intricate question of the Hebrew calendar system, its character, sources and origin.

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* Gen. vi. 9–22; vii. 6,11,13–16a,17 in part, 18–21,24; viii. 1,2a,3b–5,13a,14–19; ix. 1–17,28 sq.

We have abundant reason *a priori* to expect in this narrative a more or less complete treatment of the calendar, both from the character and utterances of the Priestly Document elsewhere, and from the character of the Assyro-Babylonian original to which the Creation and Flood-stories of this writer may, more or less directly, be referred.

1. Beginning with the latter, it is significant for our enquiry that the two digressions of P into general history, the narratives of the Creation and of the Deluge, each go back to the now well-known cycle of *calendar* myths discovered by Geo. Smith (*Chald. Acc. of Genesis*, London, 1876). This series of extremely ancient myths, which stand connected with the twelve months of the year and afford the explanation of the twelve signs of the Zodiac, are grouped into a single epos in twelve cantos, recounting the adventures of the Assyrian hero Gilgames (formerly read "Izdubar") and correspond to the twelve labors of Hercules in classic mythology. In this series the first was the cosmogonic or creative myth, corresponding to the sign Aries, the symbolic Accadian name for the month being *Bara zaggar*, "Altar of the demiurge." The eleventh, on the eleventh tablet, was the Deluge-myth, corresponding to the sign Aquarius, this month of the year being designated aš A. AN (šur), "The Curse of the Rain."*

Now the Creation-story of Genesis not only gives positive evidence, as well as the Flood-story, of dependence upon the Assyro-Babylonian cycle of calendar myths, but P exhibits, both in Gen. I. 14 and in the Flood-chronology, a degree of sympathy for the purpose of these myths, viz., the regulation of the luni-solar calendar. The fifth Creation Tablet reads according to Schrader's revised translation:

1. Excellently he made the [twelve ?] abodes of the great gods ;
2. the stars he brought forth like ...lumaši.
3. He regulated the year, assigned to it decades ;
4. for each of the twelve months he fixed three stars.

In the fragmentary remainder the movements of certain stars, and particularly the functions of the moon, are regulated.

The best commentary on this passage is a couple of fragments from Diodorus Siculus II. 30 quoted by Lenormant.†

> "Over the course of the five planets are placed, according to the Chaldaeans, thirty [six] stars, called the Counsellor-gods ; half of these look toward the places on the surface of the earth.... Every ten days one of them is sent as a messenger of the stars from the upper to the lower regions, while another quits the region located below the earth in order to ascend to those who are above; this movement is exactly defined and continues constantly, in a period which does not vary."

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* A detailed comparison of the calendar myths with the signs of the Zodiac as they appear on the cylinders, with some further *rapprochements* to the Genesis stories, may be found in Lenormant, *Beginnings of History*, chap. VI., "The Ten Antediluvian Patriarchs."

† *Beginnings of History*, p. 495.

In the Babylonian system the year consisted of 360 days (=twelve months of 30 days each). It was divided into 36 decades (Tablet, line 3) or 3 for each month, a system subsequently adopted by the Greeks. The months accordingly were not lunations, though doubtless approximated to the lunations, but an arbitrary period of 30 days, marked by the rising and setting of certain constellations which subdivided each month into three decades or periods of ten days. These decades again were divided, each half-decade being named from the presiding deity.

The "twelve* mansions of the great gods" (line 1) are also explained by Diodorus, in the same passage:

> "There are twelve Ruling-gods above the Counsellor-gods, each presiding over one of the twelve months of the year and one of the twelve signs of the Zodiac. (Cf. Heb. *Mazzaloth* or *Mazzaroth* Job xxxviii. 32; II Kgs. xxiii. 5).

The "abodes" accordingly are the constellations of the Zodiac. The calendar is astronomical and theological in one, regulated, as among nearly all peoples, by the priesthood, who are both mystics, astrologers and astronomers. The system itself is known to us from many sources, and was curiously elaborate as well as accurate, combining the decimal and duodecimal systems. The day consisted of twelve (double) hours, and the week, terminated by a Sabbath on the 7th, 14th, 21st and 28th of the month, was also employed; but apparently the first of the month (originally the first of the lunation ?) was always the first of the week, the 29th and 30th being excluded from the series of hebdomads. The length of the year being very exactly determined, a system of intercalation served to compensate the civil year, but apparently the intercalation was always of whole months of 30 days. According to Sayce,† however, the first intercalation was not of a single month every 6th year, but of two months every 12th year, this twelve year period being identified as the *annus Chaldaeus* of Censorinus, a cycle which marks also one revolution of Jupiter and six of Mars. These two intercalary months were called the maqru ša addari, "incident to (the month) Adar," and ululu šanu, "second Elul," and had each 30 days, as we know from the hemerologies. Besides these a third intercalary month, nisannu šanu, "second Nisan," was inserted at a period sufficient to compensate the fraction (5 hrs. 48′ 48″) by which the true value of the year exceeds 365 days. This, it is readily seen, could only have been the double *soss* of 120 years, or 10 times the *annus Chaldaeus*. In this period Saturn returns to the same point in the heavens after four revolutions, Jupiter after ten and Mars after 60. The true discrepancy of the civil year would amount to 29 days 1 hour and 36 minutes. Lenormant‡ argues for the existence of a 3d period of intercalation at the expiration of a *ner* of 600 years, but there seems to be a confusion in the mind of the French savant as to the number of intercalary months at our disposal. It is also difficult to make out the part played by lunar cycles. But it is beside our present purpose to further investigate the system. A sufficiently clear idea will have been gained by the reader as to the civil, astronomical and theological aspects of the Babylonian calendar.

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* A number is to be supplied, which from line 4, and from the connection, is certainly twelve.

† *Trans. of the Soc. of Bibl. Arch.*, vol. III., p. 160.

‡ *Beginnings of History*, p. 257.

Both the Creation and Flood-myth of the tablets are greatly condensed, and of course purified of their polytheistic character, in Genesis; but the horological importance of sun and moon are unmistakably predominant in Gen. I. 14, and indeed to an extent scarcely explicable save by the discovery of the Babylonian prototype. The function of "the two great lights" is to serve "for signs, and for sacred seasons (*mo'edhim*), and for days, and for years." What these sacred seasons and appointed days and years are, we begin to learn as soon as we reach the main body of the work, the ceremonial law, in which the accurate determination of the dates of feasts, new-moons, sacred days, anniversaries and sabbath and jubilee years was a matter of paramount importance. So the light-diffusing power of sun and moon in Gen. I. 15 is quite subordinate to their importance as time-keepers. The succession of day and night in Gen. I. is considered independent of the sun (cf. Job XXXVIII. 19sq., 24), which is not created until the fourth day, and this conception is both natural in itself and common in antiquity, as we learn for example from the myths of Phoebus and Aurora. To the author of Gen. I. sun and moon are primarily "rulers over the day and over the night." There is therefore, in addition to the practical identity of matter in the Babylonian and Hebrew cosmogony, a degree of sympathy visible in P's Creation story with the calendrical interest of his model.

If we turn now to the Flood-story of P, we shall find still more reason to acknowledge that not merely its material is derived from Babylonian sources, but its peculiar chronological form, the main feature distinguishing it from its "prophetic" counterpart, is due, if not to direct imitation of a Babylonian model other (and later ?) than that followed by J, then certainly to a real interest in the regulation of the calendar, corresponding to that which pervades the myth-cycle in its antochthonous form.

The calendar myths of Babylonia circulated in different versions, one of which (that reported to us by Berosus, as quoted both by Polyhistor and Abydenus) dated the beginning of the Deluge on "the 15th of the month Daisius." If with Lenormant* we suppose Berosus to have written simply "the 15th of the eighth month" which the Macedonian writers translated into 8th of the Syro-Macedonian system, viz. Daisius, a Hebrew writer whose civil year began with Tishri, at the autumnal equinox, might call this the 2d month. The nearness of this date to 17th of the 2d month, P's date for the beginning of the Deluge (Gen. VII. 11), is certainly striking. But even without this conjectural reading of Berosus the very fact of the existence of one form of the Babylonian calendar-myth which *dated the story by the day of the month* gives an unmistakable hint of the source of the chronological system presented in P's Flood-narrative, and we shall naturally conclude that these dates in the Babylonian myth, if not in P's narrative, had more to do with periods of the calendar than with historical fact.

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* *Beginnings of History*, p. 413.

Finally we have in Gen. VII. 24; VIII. 3 sq. an indication that P was in fact following some such Babylonian narrative, and following much more closely than is commonly supposed. Here there is a double reckoning, in days and months, and according to this reckoning 150 days = 5 months exactly. We are prevented from supposing the 150 days to be a mere round number by the fact that the terminal date is expressly given as 17th of the 7th month. Hence the months had each 30 days. But it is simply impossible to consider these Hebrew months. From the earliest period and throughout all their history the Hebrew month was an observed month, dependent upon the appearance of the new-moon. If the new moon was not discovered by any observer—whether from actual non-appearance, or from concealment by clouds—on the 29th, the month had 30 days, otherwise 29; but as the mean lunation has a value of very nearly 29½ days (29.530588) no period of 5 months could possibly be estimated at 150 days, the months usually having alternately 29 and 30 days. Jewish astronomy, of the post-exilic period at least, was of no mean order, and while it continued for centuries the practice of checking its predictions as to the beginning of the month by actual observation, it had long ceased to be dependent upon the eye and was able to fix with remarkable accuracy the mean lunation, so that observation became ultimately a farce. Thus the Talmud reports (*Rosh-ha-shana* 25. 1) that R. Gamaliel claimed to have received from ancestral tradition a value for the lunation of 29½ days 40 minutes, and Josephus regards the long lives of the patriarchs as intended to enable them to observe the lunar cycle or "great year" 600 years = 7421 lunations,* the triumph of Babylonian astronomy. A writer so minutely precise and painstaking with all his calculations as P would either have avoided the use of the reckoning by days alongside of that by months, or would have said "at the end of 147" or "148 days." The use of the even month of 30 days can scarcely be accounted for except by supposing P to follow, more closely than is commonly supposed, some Babylonian original; for the arbitrary equal month of 30 days is a peculiarity of the Babylonian calendar. The close general connection of the Creation and Flood narratives of P with Babylonian originals being an admitted fact, we are certainly justified by the special phenomena above noted in looking for a calendar significance in the dates of P's Flood-story, if not (as Bunsen, Lenormant and others have supposed) in all the dates of P in Gen. V.–XII. 4.

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* *Antiq. Jud.*, I. 3, 9.

2. The deduction drawn from the character of the sources followed by P is materially strengthened by the general character of his own work as well as by specific legislation later on.

Among nearly all peoples the regulation of the calendar has been a peculiarly priestly function, while its periodic days have as invariably assumed a religious character. Even Gregory the Great in reforming the Julian calendar was but resuming the ancient office of *pontifex maximus.* It is therefore easy to see *a priori* that this kind of legislation belongs peculiarly to the province of P. We do not have to go beyond the opening chapter of his work to find him entering upon it. The importance of new moons and Sabbaths to ancient Israel scarcely needs to be emphasized, but it seems not unlikely, from the Assyro-Chaldean practise above referred to, that the Sabbath originally was dependent on the lunation, marking the 7th, 14th, 21st and 28th day, or the last of each lunar "quarter;" either the 29th or 30th, according to observation, formed then the next "new moon." The arbitrary succession of hebdomads independent of the moon's phases, whose origin P refers to the creation itself, was in this case substituted, probably within the historical period, for the ancient lunar method.

It is scarcely possible for those who enjoy the blessing of a fixed self-regulating calendar to realize the vital importance for the regulation of even every day life in any civilized community, of the determination of the civil year. The confusion produced at Rome by the pontiff's manipulation of the calendar, before the reforms of Julius Caesar, are an illustration in point. But the importance of the matter becomes tenfold greater, when, as in the Priestly Legislation, the attempt is made to regulate the whole life of a people according to fixed periods, to which the most important religious ceremonies and obligations are attached, and which are named as occurring in perpetual cycle upon certain days of the year. Read the provisions of the Priestly law as to the Passover and other feasts, the great day of Atonement and beginning of the year, the Sabbatical year of release, and the year of Jubilee, and think how absolutely essential to the carrying out of any such scheme is the definite fixing of the calendar.

The date of *introduction* of the Priestly Law, whatever the date of its *composition*, is the date of reformation of the calendar; for the two are inextricably bound up together. One is almost complementary to the other. Ascertain when a central authority was endowed with the function of regulating the calendar according to "signs and seasons and days and years" and you know when the Priestly Legislation became practicable. Ascertain the source of its calendar and you know the origin of the system. For, if the year might vary in length from the lunar year of 354 or 355 days to the year of Numa of 366¼ days, how e. g. would it be possible to carry out the provisions of Lev. XXVII., where, on account of the reversion of lands to the original owners in the Jubilee year, a discount is to be made from the lease-price proportionate to the proximity of the Jubilee?

The Priestly Legislation presupposes as an absolute necessity a definite calendar system, and if such a system were not already in use, the author of the Code would find himself simply obliged to construct one. The Priestly system without an elaborate regulation of the calendar is absolutely impracticable, it lacks the very foundation. As a matter of fact we find its foundation laid in a system of chronology so astonishingly elaborate as to fix the very year and day of creation itself, and in particular, before we come to the great mass of ritual law, a fixed point is found for the beginning of the year. Next to the creation, perhaps the most important event for the writer, before the giving of the law, is the deliverance from Egypt. The former serves for the fixing of the week and the Sabbath, the latter for the beginning of the year. When all is ready for the exodus the divine fiat comes to Moses and Aaron saying, "This month shall be unto you the beginning of months; it shall be the first month of the year to you." Previously, it is here supposed, the beginning of the year was Tishri, as in the ancient Jewish practise (Ex. XXIII. 16; XXXIV. 22). But when was the end of the year? or rather, what was its length? for this was simply vital to the system. The answer to this question is readily found—has long since been found by many scholars, among whom it is sufficient to name Ewald* and Lenormant†—in the Flood-chronology.

According to Gen. VII. 11,24; VIII. 4f,13f the epochs of the Flood are marked as follows:

Beginning	2d month	17th day.
Climax	7th "	17th "
Mountain-tops appear	10th "	1st "
Waters dried up	1st "	1st "
Earth dry	2d "	27th "

There is however one period by no means unimportant which is here left out of account, viz., that of warning to Noah and of the construction of the ark. If, as seems probable, P's Babylonian source gave no dates for this period, it was not so with the narrative which according to the dominant school of criticism was his main reliance. In the prophetic version (J^2) the first two principal periods of the Flood are the seven days warning, and the forty days rain, VII. 4. In spite of the plausible *rapprochement* of Lenormant of Berosus' date, 15th of Daisius, I feel obliged to assume that P's adoption of the 17th of the 2d month for the beginning of the actual cataclysm was a departure from his Babylonian model in favor of J^2, the 47 days from the beginning of the year to the 17th of the 2d month being nothing else than the two preliminary periods of the "prophetic" version, 40 days + 7 days, adopted to stand for the time of warning and of building of the ark, covered by Gen. VI. 13-22.

***Jahrb. d. biblisch. Wissenschaft*, vol. VII., p. 9.

† *Op. cit.*, p. 411.

This impression is very strongly corroborated by the peculiar nature of the last period in P's chronology. Can any one read Gen. VIII. 13a and not experience more or less of a sensation of surprise on coming to verse 14 ? Not that it was not highly desirable that "Noah and they that were with him in the ark," even the animals included, should restrain their impatience for 57 days after "the waters were dried up from off the earth," and not go out while the ground was soft and muddy; but it is rather surprising that the author of the narrrative should have exercised such extraordinary forethought against their getting their feet wet, and still more surprising that, when it took but 60 days for the waters to retire completely from a height equal to the highest mountains, it should take 57 days more to merely dry the surface of the ground. In short VIII. 14 with its additional period of 57 days *to dry the ground* has every appearance of an afterthought. Leave it out, and the connection is smoother than before.

Suppose then we attempt to reconstruct from these probable data in reverse order the chronology of the *Babylonian* Flood-narrative P may have been following. It ended on the 1st day of the 1st month of the 601st year of Hasisadra-Noah. The mountain-tops appeared on the 1st of the 10th month of the 600th year; and it began with a period of 150 days (= 5 months) of increase of the waters of the flood; for we have seen that this datum of P must have been derived from the Babylonian source. Knowing the cyclical character of the great Babylonian year of 600 years, and the calendrical character of the myth, can any one doubt that its original chronology was as follows ?

Beginning of Flood..........	600th year (of Hasisadra ?)	1st mo.	1st day
Climax, after 150 days (= 5 mos.)..	600th "	6th "	1st "
Mountaintops appear, after 150 days more........................	600th "	10th "	1st "
Waters dried up, after 60 days more.	601st "	1st "	1st "

Here are all the characteristics of the Babylonian calendar year of 360 days, the "decades," the 60-day period, the even month of 30 days, the "great year" of 600 years. But the Priestly writer could not take over bodily the Babylonian calendar. If there were no other reason, the religious ceremonies connected in the Hebrew ritual with the appearance of the new-moon demanded an observed month instead of the regular 30-day month of Babylon. What then has he done ? Thrown the system slightly out of adjustment in the first part (at VIII. 5 where he comes back to the even 1st day of the month he resumes the thread of his source), by inserting a 47 day period at the beginning; and given it a new adjustment corresponding to the Hebrew luni-solar year, by appending a 57 day period at the end (VIII. 14). What this new adjustment was we still have to inquire.

As already observed, scholars have long since recognized in this chronology of P a determination of the Hebrew luni-solar year. This determination rests of course upon the fact that the beginning of the Flood and entrance of Noah into the ark is dated on the 17th of the 2d month of his 600th year, and his exit on the 27th of the 2d month of the 601st year. For, if one is reckoning according to the Hebrew system of lunar months, one must add ten days to the day of the terminal month for each solar year, and thus compensate for the deficiency of the lunar year, in order to reach the equivalent date in solar time; because 12 x 28½ = 354. If now the solar year was reckoned at 364 days we can readily understand why the exit of Noah is dated on the 27th instead of the 17th of the 2d month. The ten days represent the luni-solar discrepancy as appears from the following denunciation from the Book of Jubilees, a work of the post-exilic period devoted to this very subject of the civil-ecclesiastical calendar, then the all-absorbing topic, against persons who aimed to determine the feasts "according to their own views and their own errors." "There will be those," says the author, "who will employ observations of the moon. Now the moon corrupts the periods of time, and anticipates each year *by ten days.* Thus will they hereafter corrupt the years and appoint a wrong day for the day of the Testimony and a wrong day for feasts, and shall err in months and sabbaths and feasts in jubilee-years." It is obvious that the addition of ten days to dates by day of month was then current.

But there is one insuperable obstacle to this explanation of the date. *It is absolutely incredible that P should have reckoned the solar year at 364 days.* Even if we leave out of account the 365 years of Enoch's life (Gen. v. 23) which are certainly not accidental, it is impossible to suppose an error of 1¼ days in a people of the mental development of Israel, midway between Babylon and Egypt. In forty years the "first-fruits" would have been extreme last fruits, and all the seasons shifted. No people of any degree of civilization has ever maintained for any length of time a year so widely differing from the true. It is a practical certainty that P reckoned 365 days to the solar year, and Ewald and Lenormant, being well aware of this fact, escape the difficulty by the bold method of assuring us, "The Deluge has thus lasted altogether one lunar year, plus *eleven* days."* But as I read P's chronology he adds *ten* days, and not *eleven*, to the lunar year, and this figure ten is confirmed by the above quotation from "Jubilees."

The distinguished scholars have been misled by the modern Jewish practise of the alternate full (30 day) and deficient (29 day) month. But this practise dates only from the introduction of the Metonic cycle and well-known later Greek system by the second Hillel, *circ.* 330 A. D. Previous to this date it was distinctive of Jewish particularism that they clung pertinaciously to the month of actual observation. Now the alternate system reckoning 29½ days to the month gives of course a lunar year of 12 x 29½ = 354 days. But close observation would show the mean lunation to be so much greater than 29½ as to make 355 days actually nearer the true lunar year than 354, and we have seen evidence that the Jews at the beginning of our era knew the great cycle 600 years = 7421 lunations, and hence both could and did calculate the mean lunation as close as the figures attributed in the Talmud to the family of Gamaliel. I cannot but think that the reiterated statement of Lenormant* that the Hebrew lunar year contained but 354 days is erroneous. Certainly it could not have remained so for two consecutive years, and there seems to be abundant reason to think it had normally 355. The calendar of Numa made the lunar year consist of 355 days, and while tradition reports that this number was chosen instead of 354 "because the odd was more lucky than the even," it is not likely that such considerations would have determined the matter had it not been known that the real value is between 354 and 355, the latter being in reality somewhat more correct.

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* *Beginnings of History*, p. 411. See Ewald as there quoted. I have not yet been able to verify the quotation personally.

The explanation of the final date of P's Flood-chronology, 27th of the 2d month, in contrast with 17th of the 2d month as the date of beginning, is in reality the lunar deficiency of *ten* (not *eleven*) days, and his readjustment of dates in the Babylonian calendar myth which he was following afforded the determination of the length of the luni-solar year which his system demanded, viz., 1 lunar year of 355 days + 10 days = 1 solar year, the only period of time to which the name "year" (*shanah*, "repetition," "cycle," = *annus*) can properly apply.

The bearing of these facts upon the question of the date of P and the significance of his chronological system in general is a subject for future investigation.

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* *Op. cit.*, pp. 253, 285.